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A PECULIAR FIBROUS FORM OF OPAL[1]

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U. S. National Museum

THE material described below was received at the National Museum from Mr. G. U. Snapp of Metolius, Oregon, who stated in the letter accompanying it that "in making a cut thru a gray rock in road work, we found what appeared like a petrifaction of wood. . . . Around the glassy center of the supposed petrifaction is the woody fiber." Samples of the latter he enclosed under the impression that they might be asbestus, which indeed they somewhat resemble.

The gray rock mentioned proves to be a mixture of opal and chalcedony, but resembles some of the more highly colored pitchstones, for which it was at first mistaken. Imbedded within it are bunches of a light gray fibrous material, which abuts as sharply against the massive portions as do the fibrous veins of Canadian chrysotile against the massive serpentine. Indeed, the resemblance to some of the occurrences of the well-known serpentine asbestus is striking, the fibers being in some cases 50 mm. in length. Between the fingers the material has, however, a slightly harsh feeling, is brittle, and breaks down into loose, fluffy, pellet-like forms resembling nothing more closely than the "slag"- or "mineral-wool" formed by driving steam thru a molten slag and used in fireproof packing. Under the microscope the massive material, as noted above, is seen to be a mixture of chalcedonic and opalescent silica in forms sufficiently well-known and characteristic of deposits from solution to need no description. The asbestiform material shows long wavy or slightly undulating colorless and isotropic fibers tapering gradually to a not very acute point, breaking easily and abruptly into short sections; in some cases these are quite structureless,

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or again possess an interior, indistinct granulation, or rows of blunt saw-tooth-like processes along their margins. Other and larger fibers, some 0.1 mm. in diameter, equally isotropic, show faint interior spiral marking and have at times the appearance of a small fiber wound spirally around a larger one. These I am told by Dr. F. H. Knowlton are unmistakably of vegetable origin.

A rough analysis of the fibers, without assorting, yielded me: Ignition 5.62 per cent.; $Al_2O_3 + Fe_2O_3$ 4.72 per cent.; SiO_2 89.56 per cent., the silica being determined by evaporation in hydrofluoric and sulfuric acids, the iron oxide and alumina forming the residue.

THE PROBABLE IDENTITY OF MAZAPILITE WITH ARSENIOSIDERITE[1]

ESPER S. LARSEN

U. S. Geological Survey

A MICROSCOPIC examination of mazapilite and of arseniosiderite, both of typical material and from the original localities, shows that the two minerals are very similar, altho the published chemical analyses indicate a greater difference than would be expected from good analyses of pure material. It is probable that the analysis of mazapilite is more accurate, since it is more recent and was made on good crystalline material; a little admixed hematite in the arseniosiderite from Romanché would account for the difference in the two analyses.

The properties of the two are summarized in table 1. Only a single small crystal of mazapilite was available and the material examined was scraped from one edge, as deep as a quarter of the way to the center of the crystal. It was sensibly homogeneous, but some fragments indicated a crystalline aggregate rather than a single crystal and it is possible that they represent a pseudomorph of arseniosiderite after a crystal of a preëxisting mineral. Altho both specimens appear to be sensibly uniaxial, the mineral is probably biaxial with a very small axial angle since that from Mazapila is in good orthorhombic crystals, and that from Romanché has the optic axis normal to the fibers.

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TABLE 1. COMPARISON OF ARSENIOSIDERITE AND MAZAPILITE

	ARSENIOSIDERITE	MAZAPILITE
Locality	Romanché, France (U. S. Nat Mus. 84358)	Jesus Maria Mine, Mazapila, Mexico (U. S. Nat. Mus. 85174)
Composition	$6CaO.4Fe_2O_3.3As_2O_5.9H_2O$(?)	$6CaO.4Fe_2O_3.4As_2O_5.12H_2O$
Color	Yellowish brown	Black. On fracture deep brownish red
Streak	Yellow brown, rather deeper than yellow ocher	Ocher yellow
Hardness	1 to 2 (?)	4.5
Sp. gr.	3.520	3.567–3.582
Habit	Fibrous	Prismatic crystals
Optical character	Uniaxial (?), —	Uniaxial (?), —
α	1.792 ± .005	1.815 ± .005
β	1.870 ± .005	1.898 ± .005
γ	1.870 ± .005	1.898 ± .005
Optical orientation	X normal to fibers and to a face or cleavage	
Pleochroism	X = very pale brownish red, nearly colorless Y and Z = brownish red	X = nearly colorless, very pale brownish Y and Z = dark reddish brown

The tabulated data show some differences between the two specimens, but these are more apparent than real. As regards color and hardness, it is commonly true, and to be expected, that a finely fibrous variety of a mineral has a color nearer that of its streak, and apparently a lower hardness. The streaks are essentially alike for both minerals, and this is more uniform in minerals than the color. Specific gravity is one of the important constants of minerals, but accurate measurements are so difficult and depend so much on inclusions of gas or other material that measurements on the same mineral in different states of aggregation commonly vary much more than do the two specimens here described. The indices of refraction, while not identical, agree as closely as is common for measurements on different specimens of the same species; a small difference in chemical composition would account for the difference in indices, especially for a mineral with high indices of refraction and most minerals are not by any means simple chemical compounds, as is NaCl, the formulas assigned to them being only approximations and moderate variations in composition being frequent. The essential properties of these two specimens are on the whole so similar as to leave no doubt in the author's mind as to their identity. The name arseniosiderite has priority, and should be retained for the species.

FAMOUS MINERAL LOCALITIES. 2. THE GEM REGIONS OF NORTH CAROLINA

HARRY W. TRUDELL

Philadelphia, Pa.

In almost every publication dealing with the gems to be found in the United States prominent mention is made of North Carolina's production of precious stones and other valuable minerals. In addition there are very few mineral collections which do not contain some specimens from this state. Any one interested in collecting or studying minerals is likely to have their ambition stirred with a desire to visit such a locality, where, it would be expected, the dumps of the mines might yield some very attractive material.

After reading several such articles and Dr. George F. Kunz's admirable "History of the gems found in North Carolina" the writer and Mr. Samuel G. Gordon decided to make a trip to this promising field. After investigating routes, costs, etc., we left Philadelphia July 29 via the Pennsylvania Railroad for Baltimore, where we had arranged to take the York River Line steamer, a pleasant, comfortable and interesting way of getting to Richmond; leaving Baltimore at 6 P.M., we reached Richmond the following morning at about 9 o'clock. The day was spent enjoyably in visiting some of the many historical spots for which the old Confederate capitol is noted. A Southern railway train left promptly at 6 o'clock for Danville, and the earlier part of the trip was interesting and entertaining by reason of the new country and incidents to be seen at the various stops. Danville was reached at 11.30 P.M., and leaving there at 12.45 A.M., we reached Salisbury, N. C., at 3.20 A.M. In normal times it is possible to get a thru train, but military needs had disrupted conditions considerably. We remained at Salisbury until 5.50, being treated to a beautiful sunrise with a concert of mockingbirds. We found ourselves at Statesville at 6.35, where we breakfasted and rambled about the clean shady streets. From Statesville our route lay to the northwest over the Taylorsville Branch, to the town of Hiddenite, about four miles beyond Stony Point (usually spoken of as the place from which were obtained the wonderful specimens of hiddenite and emerald).

The run of 20 miles was soon accomplished and we found ourselves at last in the "promised land."

Inquiries at the station disclosed the fact that one of the mines was about a half mile to the north. We walked up the road paralleling the railroad, to the farm of Mr. J. E. Turner, where in the front garden we saw many immense quartz crystals, chiefly of the smoky variety, surrounding the flower beds. We found Mr. Turner to have had considerable experience in gem and precious-metal mining, and in addition to be very hospitable to visiting mineralogists. The old mines, now much overgrown with vegetation and fair-sized trees, are almost obliterated, and the red top soil has washed into the openings, completely hiding the rock from sight. In the nearby woods are numerous small prospects, many of which produced good specimens of hiddenite in the past, but the present outlook, for a short stay, was very unpromising. We attacked a large pile of rocks, the old dump, which produced only a little rutilated quartz. Our spirits were by this time considerably toned down, but we decided to try another location south of the station, after obtaining the permission of Mr. Turner, who is also in charge of it. Mineralogically there was no result, but we had the unique experience of falling under suspicion as possible cow poisoners; we are not sure that we completely cleared ourselves of this suspicion, but Mr. Turner greatly enjoyed the episode, and no doubt later lifted the stigma from our reputations. We camped out overnight, but after two days of fruitless search in the vicinity, decided to "break camp," and with our belongings in knapsacks, and a kindly farewell from Mr. Turner, we started for the station.

Statesville was reached at 6.40, but we had to wait until 11 P.M. for a westbound train. At 3 A.M. the train stopped at Black Mountain Station in a steady downpour of rain; everything was black here, even the two fellow-travelers who got off with us, but they soon merged into the surrounding blackness and we were alone. Fortunately the station building was unlocked and we managed to make ourselves comfortable until daylight. The dawn was gray and wet, with ragged clouds about the surrounding peaks. Such weather conditions were of course decidedly poor for our proposed four-days' tramp over

Mount Mitchell and the country beyond, to Spruce Pine some sixty miles away. Nevertheless, as there seemed but little prospects of the weather clearing, we started for the summit of Mount Mitchell about 18 miles away and 6,711 feet above sea level. The climb, while severe and disagreeable, when it showered, was on the whole interesting, and about 2 o'clock it cleared off nicely. Our camp that night was very agreeable, being at the head of Mill Creek Valley, and affording a wonderful view. Our only mineral find here was cyanite, on the north slope of Mt. Mitchell, along the government trail. After a day of more or less rain and much mud, we reached the mica mine on Crabtree Creek, the exact location being about two miles northwest of the junction of Yancy, Mitchell and McDowell Counties. Here, due to the rain, we spent the night in a mine tunnel. An investigation disclosed nothing of interest on any of the dumps about the place. There is a sameness to the pegmatite from which mica is obtained in this whole district. Finally on Saturday evening at 6 o'clock, rain-soaked, muddy and footsore, we arrived at Spruce Pine, where we were fortunate in securing accommodations at "The English Inn," conducted by Mrs. Josephine English Dorsett, whose warm hospitality will always make us look back on this part of our trip with the greatest pleasure and satisfaction.

We remained here for 5 days, making excursions to the various mines in operation near Spruce Pine; at the Dake Mines (usually misspelled Deake) about 1¼ miles from Spruce Pine, on the south bank of the North Toe River, we found garnets, traces of uraninite, autunite, etc. About two miles further, on the same side of the river, are the Bailey Mines, where there are very extensive operations, some of great depth. Here we found small specimens of uraninite, autunite, gummite, monazite, ilmenite and garnets. We located Flat Rock Mine about ½ mile across the river, but after a steep climb, we found absolutely nothing, as the mines were not in operation. We made a visit to the kaolin washery at Spruce Pine, but the soft material is pure, and we made no mineral finds. The Wiseman Mines are on the west side of Beaver Creek about 2½ miles from Spruce Pine, high up above the creek bed. We here obtained fergusonite (or cyrtolite), some attractive oligoclase, and autunite in limited

amounts. These mines are being worked for feldspar, but mica and other minerals are frequently encountered; for instance, a 300-pound mass of samarskite had recently been found, which was held at $1.00 per pound. The quarrymen know most of such rare-metal minerals, and carefully save them, so that the chance visitor requires a "silver pick" to obtain much in the way of specimens. There are a large number of mica and feldspar mines within a radius of 5 miles of Spruce Pine, most of which are within three miles and can be reached over fair roads, which wind their way thru very picturesque scenery. If one had sufficient time to devote to this district, doubtless interesting finds would be made, but our time was too limited and while we worked very hard, we accomplished but little. The Grassy Creek aquamarine mine, located 5 miles southeast of Spruce Pine, is now closed due to litigation, and we were advised not to visit this, as the dumps had been gone over most carefully, and washed by the owners; furthermore visitors were not permitted on the property. Nor did we get to the emerald-matrix mines which are located 7 miles from Spruce Pine (3½ miles due south from Estatoe). It was from these mines that most of the emeralds in matrix came which we saw used in jewelry so much about Spruce Pine. We finally left over the Clinchfield, Carolina & Ohio Railroad for Marion. The distance is about 23 miles and the route most picturesque, embracing some very extensive mountain scenery of great beauty; nineteen tunnels were passed thru on this short run. Close connections were made at Marion for Danville via the Southern Ry., and from there we went to Amelia Courthouse, Va. What happened here will be described in another article.

NOTES AND NEWS

The editors will appreciate receiving for this column items of interest to mineral collectors.

Mr. Albert B. Peck, formerly in the department of mineralogy of the University of Michigan, has been appointed assistant physicist in the U. S. Bureau of Standards at Pittsburgh, Pa., where he will carry on petrographic studies on cement, porcelain products, etc.

Dr. Horace B. Patton, for twenty-four years professor of mineralogy at the Colorado School of Mines, has opened an office at 817 Fifteenth St., Golden, Colorado, as a consulting geologist.

Mr. Earl V. Shannon, of West Haven, Connecticut, and Mr. M. L. Jandorf, of York, Pennsylvania, have been called into the national army.

It is with the deepest regret that we chronicle the death of Dr. Louis Pope Gratacap of the American Museum of Natural History. From the beginning he had been one of the staunchest supporters of this magazine,—contributing an elaborate article on Madagascar minerals to one of our early numbers,—and the loss of his helpful advice and encouragement is keenly felt. A fitting tribute to his memory will appear in our pages in the near future.

PROCEEDINGS OF SOCIETIES

The Newark Mineralogical Society

The 19th regular meeting of the Newark Mineralogical Society was held Sunday, December 2, 1917, with eight members present. In order that the society might become better known to Newarkers, the Secretary had previously been instructed to get in communication with the Newark Museum and make arrangements to have a large card hung in the Museum announcing that there was a mineralogical club in the city. The Secretary reported that this had been done and a card would be ready in a few days, which we trust will lead to good results. A motion was then presented and carried that Dr. Wm. S. Disbrow, the founder of the Newark Museum, be elected an honorary member.

The following resolution on the death of Mr. Albert H. Petereit was then adopted:

Whereas, The sudden death of Albert H. Petereit on Monday, November 5, was a great shock to the members of the Newark Mineralogical Society, as he had attended the monthly meeting of the Society the previous day and seemed in good health, taking part in the discussions with his usual vigor,

And Mr. Petereit was a charter member of the Society, deeply interested in its welfare and growth, and adding interest to its meetings by the display of many fine specimens. Therefore be it

Resolved, that the members of the Newark Mineralogical Society desire to record their sincere sorrow on the death of their fellow member, recommending that this minute be incorporated in the proceedings of the December meeting and a copy of the same be sent his family.

After a talk and demonstration on blowpipe testing by Dr. Colton the meeting adjourned.

Wm. H. Broadwell, *Secretary*

The Philadelphia Mineralogical Society

Wagner Free Institute of Science, December 13, 1917

A joint meeting of the Philadelphia Mineralogical Society and The Wagner Institute Society of Chemistry and Physics was held on the above date with the President, Dr. Leffmann, in the chair. Eleven members and a large number of visitors were present. On motion, the regular business was suspended.

Dr. Charles H. LaWall, president of the Wagner Institute Society of Chemistry and Physics, delivered his presidential address on "Colloids." The history and the salient facts of this modern development of chemistry were presented, illustrated with many experiments showing the properties of colloids.

Samuel G. Gordon, *Secretary*

NEW MINERALS

Crestmoreite

Crestmoreite, a new mineral; in: Minerals associated with the crystalline limestone at Crestmore, Riverside County, California. Arthur S. Eakle, Univ. of Cal. *Bull. Dept. Geol.*, **10**, (19), 344–346, 1917.

NAME: After the locality, Crestmore, Riverside Co., Cal.

PHYSICAL PROPERTIES

Color: Snow-white; luster: vitreous to dull; structure: compact massive. H. = 3. G. = 2.22.

OPTICAL PROPERTIES

Crestmoreite has parallel extinction, positive elongation, low birefringence, and $\beta = 1.590 \pm 0.005$.

CHEMICAL PROPERTIES

As most of the water is given off only at high temperatures it is regarded as constitutional, and the formula written as a hydrous basic metasilicate, H_2CaSiO_4. It is presumably an alteration product of wilkeite, and contains small amounts of the phosphate, sulfate and carbonate radicals.

It fuses quietly and easily to a slightly vesicular glass. Easily soluble in acid, leaving some flocculent silica, while most of the silica goes into solution. Some of the lime can be extracted by boiling water.

It is found disseminated in bunches in blue calcite, probably an alteration product *in situ* of wilkeite. S. G. G.

Riversideite

Riversideite, a new mineral. Arthur S. Eakle, *loc. cit.*

NAME: After the county in which it occurs.

PHYSICAL PROPERTIES

Color: white; luster: silky; structure: compact fibrous. H. = 3. G. = 2.64.

OPTICAL PROPERTIES (by Esper S. Larsen)

$\alpha = 1.595 \pm 0.003$, $\gamma = 1.603 \pm 0.003$; extinction, parallel; Z parallel to the fibers.

CHEMICAL PROPERTIES

The simplest formula is $2CaSiO_3.H_2O$, but it contains also P_2O_5 and SO_3, possibly due to indirect formation from wilkeite or crestmoreite.

Riversideite fuses at 2 to a white glass. It is easily soluble in dilute acids, leaving flocculent silica.

It occurs as narrow seams in masses of vesuvianite. S. G. G.

ABSTRACTS OF MINERALOGIC LITERATURE

MINERALS ASSOCIATED WITH THE CRYSTALLINE LIMESTONE AT CRESTMORE, RIVERSIDE COUNTY, CALIFORNIA. ARTHUR S. EAKLE, *Univ. Cal. Bull. Dept. Geol.*, **10** (19), 327–360, 1917. [For sale by University of California Press, Berkeley, Cal.]

At Crestmore, eight miles westerly from Riverside, there is an isolated mass of granodiorite with a capping of crystalline limestone in which there have been developed upwards of 50 minerals by contact and hydrothermal metamorphism. Chino Hill consists of white limestone, with little development of metamorphic minerals. Brucite occurs disseminated thru the limestone in rounded, pisolitic bodies, and it is presumed that it is an alteration product of primary periclase. Some of the brucite has been altered to hydromagnesite. Other minerals are graphite, phlogopite and serpentine.

The limestone of "Sky Blue Hill" was subjected to later and more intensified metamorphism by intrusions of quartz-monzonite and pegmatite, and by the hydrothermal action of the silicated-carbonated solutions accompanying or following these intrusions. Calcite of an intense blue color has developed by recrystallization and occurs in large cleavage rhombohedrons. It forms the matrix of wilkeite, crestmoreite, xanthophyllite, monticellite, and also contains minute crystals of vesuvianite and diopside. Wollastonite has been abundantly formed, and is represented by several varieties, one a fine granular, friable, and loosely coherent material. Well-formed crystals occur, glassy white to clear and colorless, on which 31 forms were observed, among them the following new ones: l (740), $\mathfrak{m}$ (140), r (104), θ ($\bar{1}04$), p (111), $\mathfrak{p}$ (744), o (344), n (144), δ ($\bar{7}44$), i ($\bar{3}44$), u ($\bar{1}44$), ω (142), and ϵ ($\bar{1}42$). A unique fact about one type of the crystals is that for every positive pyramid there is a negative one with like symbols, but the symbols for the rear faces do not correspond to the front ones; these crystals have three or four prism faces on their ends, each representing a different form. There is thus no apparent axis of symmetry, and the crystals could belong to the hemimorphic class of the monoclinic system or to the triclinic system. The mineral is strongly triboluminescent. An analysis is given. The following optical properties were determined by E. S. Larsen: $\alpha = 1.614$, $\beta = 1.629$, $\gamma = 1.631$; $2E = 58° \pm 5°$; $2V = 35° \pm 4°$; Y $\|$ fibers; Z $\perp$ fibers; parallel extinction; dispersion perceptible.

Vesuvianite occurs both massive and in crystals, 13 faces being identified, among which one is new: $\mathfrak{n}$ (154). Analysis of green vesuvianite is presented.

Diopside is found in crystals associated with garnet. The following new form was identified: $\mathfrak{n}$ ($\bar{2}31$).

Two new minerals, crestmoreite and riversideite, are described, and are here noted under that heading.

The following minerals are also noted: grossularite (with an analysis), xanthophyllite var. valuevite (with an analysis), monticellite (with an analysis), wilkeite (with an analysis), clinochlore, apatite, aragonite; in the intrusives: feldspars, pyroxene, augite, hornblende, biotite, titanite, zircon, epidote, quartz, tourmaline, axinite, datolite, scapolite, apophyllite, okenite (with an analysis), orange-colored prehnite (with an analysis), laumontite (with an analysis), opal, a number of sulfides, azurite, malachite, limonite, and hematite.

An excellent photograph of the district is appended. S. G. G.

THE MINERAL COLORING THE PLASMA OF MADAGASCAR. AND CELADONITE. A Lacroix. *Bull. soc. franc. min.*, **39** (5), 90–95, 1916. Abstract by P. A. v. d. Meulen, reprinted by permission from *Chem. Abstr.*, **11** (2), 132, 1917.

The coloring material of the plasma consists of a mineral with optical properties similar to those of mica. The substance is undoubtedly celadonite, which L. considers as being probably not one mineral, but a group of minerals, the optical properties of whose members vary but slightly with variation in the composition. Analyses of celadonite are given.

THE EXISTENCE OF RANDANNITE IN MADAGASCAR. A. Lacroix. *Bull. soc. franc. min.*, **39** (4), 85–88, 1916.

The material so named is a diatomaceous earth, and should be classed as a rock rather than a mineral, altho listed by Dana; an analysis of the Madagascar occurrence is given. E. T. W.

SOME REACTIONS INVOLVED IN SECONDARY COPPER SULFIDE ENRICHMENT. E. G. Zies, E. T. Allen, and H. E. Merwin, Geophys. Lab. *Econ. Geol.*, **11** (6), 407–503, 1916.

A description of elaborate experiments performed on chalcopyrite, bornite, and other sulfide minerals, consisting of heating them under various conditions with solutions of copper sulfate, sulfuric acid, etc. Chalcocite, covellite, metallic copper, etc., were obtained, and their conditions of formation are discussed. E. T. W.